

Iowa Communications Network
OSP Log #77163405, New Links – 72 fiber armored, 36 fiber dielectric
Polk & Dallas Counties, Waukee, W. Des Moines and Clive
Iowa Lottery Diversity, 13001 University Ave, Clive Iowa

Overview of the Project:

The ICN intends to:

Construct a new 36 fiber dielectric cable from University Ave into Iowa Lottery at 13001 University Ave, Clive, IA. This will require approximately 901' of new conduit into the Iowa Lottery and 1250' of 36f dielectric cable.

Construct a new 72 fiber armored cable from the Iowa Lottery tie-in to Alice's Road/University in Waukee. This will require:

- Installation of approximately 10,323' of new conduit along University between Iowa Lottery and 92nd St.
- Pull through existing conduit along University from 92nd St to Alice's Road.
- Installation of approximately 285' of conduit between handholes at Alice's Road/University and pulling through existing conduit.
- Install 18,500' of 72f Armored cable within new and existing conduits.

Please see the referenced engineering plans for all segments of work required. Contractor is responsible to field verify all information. See Engineering Plan sheet C.01 for engineered quantities.

Preparatory Tasks & Responsibilities:

1. Secure all necessary locates from "Iowa One Call."
2. Locate all private utilities on the properties at 13001 University Ave, Clive.
3. The contractor SHALL coordinate with the End Point and the Access Point prior to installation and contact them no less than 48 hours prior to arrival on site.
4. **Exceptions/Additions to Standard Installation Requirements:**
 - 4.1. Contractor shall comply with all City of W. Des Moines, Clive and Waukee utility construction requirements.

Duct Installation

1. Provide 1-2-inch HDPE, SDR 13.5 duct; approximately 10,608' from:
 - 1.1. Station 1+60 to Station 4+45.
 - 1.2. Station 64+84 to 159+06
 - 1.3. Station 159+06 = (0+00 Lottery) to 168+07 = (9+01 Lottery)
2. It shall be the sole responsibility of the contractor to ensure that the fiber installation is in the public Right-of-Way and on Iowa Lottery property and adjacent property utility easements.
3. Bore per the engineering plans. See engineering plans for locations and distances off existing public ROW when provided.

Handholes: Install ICN-furnished 24" X 36" X 30" New Basis handholes with 20T lid at the following locations per ICN Standard Practice: Nine new handholes at stations: 65+04, 74+52, 96+49, 115+81, 116+67, 123+76, 131+43, 143+29, 159+06

Fiber Installation

1. Install an 18,500 feet ICN-furnished, armored 72-strand single mode fiber from Station 0+00 to 159+06.
2. Install an 1250 feet ICN-furnished, dielectric 36-strand single mode fiber from Station 0+00 Lottery (159+06) to 9+84 Lottery data room.
3. **Slack Loops** shall be installed as designated per the engineering plans and sheet C.01.
 - 3.1. Typically coil 150 feet in each new handhole(s) and each existing handhole.
 - 3.2. At the Iowa Lottery data location room leave a 25 foot maintenance and at Iowa Lottery Dmarc a 50' maintenance coil on an ICN-furnished Leviton storage ring.
4. Cable shall also be routed through interior conduits per the engineering drawings.

Building Entry at Iowa Lottery 8+79:

1. Exterior Installation: Access the existing entry handhole at Iowa Lottery. Pull through existing conduit into the building; Lottery station 8+79.
2. Interior Installation: Use the existing 4 inch conduit from station 8+79 to 9+84 between Lottery dmarc and data rooms for new cable installation.
3. Fiber Installation: Pull the fiber through the conduits to the data room located at 9+84 at Lottery.

4. See the pictures in the attached engineering plan.

NOTE: At the conclusion of the project, ensure that a pull rope is left in ALL pathways, both inside and outside, new and existing.

Locate Facilities (The conduit/cable installation contractor is responsible for placement of all locate facilities and wires in preparation for the splicing contractor):

1. The metallic shield of the 72f armored cable shall be used as the locate wire and a locate wire shall be installed where the 36f dielectric cable is installed.
2. Install a contractor furnished “#12 AWG, Solid HF CCS 30 Mil HDPE High Flex Tracer Wire” orange in color and labeled “Caution Communication Line” (standard communication tracer wire) inside the conduit from Station 159+06 (Lottery 0+00) to Station 168+07 (Lottery 8+79). See engineering plans.
3. **Rhino TriView 72 Inch - bonded to armored cable:** (see standard engineering drawing for installation)
 - 3.1. At Station(s) **4+45 and 65+04** install an ICN-furnished Rhino TriView Test Station 72”, with Isolever and ICN decal. Marker can be cut down to only show warning sticker above ground.
 - 3.2. Install an ICN-furnished ground rod located in the handholes.
 - 3.3. Extend tracer wire and ground leads from the ground rod and cable to the TriView.
 - 3.3.1. Install #6 or #8 AWG solid, bare ground wire from ground rod to the ground lug center position on TriView.
 - 3.3.2. Install new #10 or #12 AWG solid copper wire from each cable and label direction. Leave enough tracer wire to match the fiber cable tail for bonding to the cable for each direction.
 - 3.3.3. Crimp style lugs with crimping tool for use on solid wire can be used. Otherwise follow the termination details on the standard drawings.
 - 3.4. Permanently ground the tracer wire at the handhole on the furnished ground rod.
 - 3.5. Cable will be midsheathed by the Splicing Contractor.
4. **Rhino Hide Out - bonded to armored cable:** (see standard engineering drawing for installation)
 - 4.1. At Station(s) **159+06** install an ICN-furnished Rhino HideOut Test Station”, with Isolever.
 - 4.2. Install an ICN-furnished ground rod located in the handhole.
 - 4.3. Extend tracer wire and ground leads from the ground rod and cable to the TriView.
 - 4.3.1. Install #6 or #8 AWG solid, bare ground wire from ground rod to the ground lug center position on TriView.
 - 4.3.2. Install new #10 or #12 AWG solid copper wire from each cable and label direction. Leave enough tracer wire to match the fiber cable tail for bonding to the cable for each direction.
 - 4.3.3. Crimp style lugs with crimping tool for use on solid wire can be used. Otherwise follow the termination details on the standard drawings.
 - 4.4. Permanently ground the tracer wire at the handhole on the furnished ground rod.
 - 4.5. Cable will be mid-sheathed by the Splicing Contractor.

Splicer Responsibilities: (Splicing excluded from Construction Bid) ICN shall provide detailed splice documents.

1. Install an ICN-furnished rack-mounted FDP in the Iowa Lottery at 9+84. Corning CCH-02U in the location pictured.
2. **Field Splicing – Daytime:**
 - 2.1. Terminate fibers 01-36 in an ICN-furnished /rack mounted FDP in the Lottery data room at 9+84. Corning CCH-02U in the location pictured.
 - 2.2. Station 0+00 Lottery/159+06. Splice 24 fibers from new 72f armored cable to new 36f dielectric cable to Lottery. Use 24 fiber count trays. Tray up the balance of the fibers in trays for future.
 - 2.3. Stations 65+04 and 4+45 mid-sheath the new 72f armored cable into a splice case, isolate the armor and bond to Contractor furnished tracers wires. Store all tubes for future.
3. **Field Splicing After Hours** During Maintenance Window (00:01 – 06:00)
 - 3.1. At New Link Splice 0+00 within City of Waukee splice cabinet, splice four fibers to existing Waukee fiber (ICN IRU) to new 72f armored cable as designated..
 - 3.2. Loss for each splice shall be .03 dB or less.
 - 3.3. Contractor SHALL label all fibers terminated pursuant to this Scope of Work.
4. **Labeling:**
 - 4.1. Rack-mounted FDP SHALL be labeled by one of the following methods:
 - 4.1.1. Make printed entries on the proper FDP directory card.
 - 4.1.2. Use one line per fiber.
 - 4.1.3. If no directory card exists, affix a machine-produced to the inside the FDP, so that it is visible when the door is opened.
 - 4.2. NOTE: Failure to label the fiber in the manner specified above will result in the Contractor being sent back to provide labels before any project payment is made.
 - 4.3. Fiber within a handhole shall be labeled with permanent metal tags showing the location it faces.

5. OTDR the 24 fiber from Lottery to Waukee; only four will be terminated on the other end. Provide test results in an “.sor” format and PDF format for ICN review and acceptance.
6. Bond all armored cables per the “**Locate Facility Requirements**” (see above and standard drawings). Follow ICN standards and manufacturers’ standard to ensure all bonds are connected to ground bar or locate pedestal for locating. 3M Scotchlock Shield bonding kits shall be used for connecting to the armored cable. Locate wires routed out of the splice case shall be sealed. For Tyco closures use the FOSC Closure Sealing Kit.
7. **Provide Pictures of the completed splicing in cases or panels showing preparation, splice trays and final installation.**

ICN Provided Materials per Table Below: Contractor shall pick up ICN-furnished materials at the ICN warehouse in Des Moines. Contact the ICN warehouse 48 hours in advance to pick up materials; contact Paul Damage (515-725-4749) to ensure availability.

Contractor shall supply all other materials required for proper installation, including but not limited to: HDPE, Grounding and Tracer Wires, Rock, Wire Mesh, etc.

ICN Provided Materials – Item	Part #	Quantity	Unit	Note:
72 strand Armored SM fiber		18,500	LFT	University Ave
36 strand Dielectric SM fiber		1250	LFT	Iowa Lottery Entrance
24” X 36” X 30” TD handholes w/ 20T lid	PC243630SN20	9	EA	
Ground rod clamp GRC12	GRC12	3	EA	
Ground rods	611360	3	EA	
ICN DRV 66” Flexible Warning Location Marker	ICN-66DRV	7	EA	
Cable Tags - Wrap around Fiber Warning Marker		20	EA	
TriView Test Station 72” Orange w/isoever & ICN Decal	TVT172OB-EM9125	2	EA	
Hide Outs orange, custom graphics w/isoever	RHTB-FIBER-EM9125	1	EA	
Corning Rack mounted FDP CCH-02U (24/48+pigtailed cass)	CCH-02U	1	EA	Splicer
CCH Splice Cassette Pigtailed, 12f SC Duplex SM UPC CCH-CS12-59-P00RE	CCH-CS12-59-P00RE	3	EA	Splicer
			EA	
Leviton storage ring 24-inch	48900-OFR	1	EA	
Tyco 450B Splice Enclosure	FOSC450B66NT0B3V	3	EA	Splicer
Tyco 450B 24 Splice Tray	863927-000	3	EA	Splicer
FOSC Closure Sealing Kit FAK-MULDRP-45-4P/CBL-ATT	1F6818-000	3	EA	Splicer
3M Scotchlok Shield Bond Connector 4460-D/FO	95077180	5	EA	Splicer

ICN Responsibilities:

1. Project Management
2. ICN will secure all necessary DOT permits.
3. ICN furnished materials; see above.

ICN Point of Contact for this Project:

Tim Flickinger
515-725-4699 office
515-491-3750 cell

Other Points of Contacts:

1. **Iowa Lottery:** Charles Crivaro, 515-725-7914

Bid/Job Showing: N/A

Work Start Date: Work may begin upon award of the bid and completion of the contract, but ICN anticipates work to begin on or about October 10th. Only written modifications to this Scope of Work are binding - Verbal changes to this scope of work by any person or persons are not binding, unless confirmed in writing.

Completion Date: Not later than November 18th. (extension may be negotiated based upon weather and/or unforeseen construction problems in the ROW)

Quotes Due Date:

Quotes must be received by Sheri Stephens, ICN Contracting, **NLT 2PM on September 29th.**

Quotes may be faxed, e-mailed or delivered to:
Sheri Stephens

ICN Contracting
Grimes State Office Building
400 East 14th Street
Des Moines, IA 50319
Fax: 515-725-4774
E-Mail: sheri.stephens@iowa.gov

Quotes: Contractors must submit quotes as Construction Bid to perform duct and fiber installation only. Contractor is responsible for all installation activities except for splicing. ICN can require a break down of lump sum bids into labor and materials.

Items under the “Splicer Responsibilities” are excluded from the Construction Bid. Splicing will be handled separately. Contractor is responsible for the installation all other items required in this Scope of Work.

STANDARD INSTALLATION REQUIREMENTS:

Note red, highlighted changes to ICN standards installation requirements as of 1/28/2016.

General Requirements:

1. The contractor **shall** pothole all existing utilities.
2. Provide the owners of any natural gas utility 48 hours advance notice that work is scheduled in the vicinity of their lines/mains so that they can provide standby and protect services.
3. Maintain proof of notification to and receipt of notification by the gas utility.
4. Permits and coordination
 - 4.1. Secure all necessary state and local (city, county, etc.) permits, public or private easements, facility permits, usage permits, and any other permit required by an Authority Having Jurisdiction (AHJ).
 - 4.2. ICN will obtain and provide copies of IDOT permits.
 - 4.3. If permits are required to be in the name of the owner rather than the contractor, the contractor shall prepare the permit for the owner's signature.
 - 4.4. Coordinate installation with all owners and AHJ over the route, the fiber, Right-of-Way and buildings in which end points will be located.
 - 4.5. Failure to coordinate with the AHJ and to obtain all necessary permits is at the peril of the contractor.
 - 4.6. Right-of-Way Permit fees are an authorized extra above the quoted bid price. Excavation permits shall be by the contractor.
 - 4.7. Ensure all facilities are placed within the public Right-of-Way.
5. Ensure that personnel working in the ROW are equipped with and use proper safety equipment and attire.
6. **All tools and test equipment required to do a project shall be provided by the Contractor or its subcontractor(s). Security of tools and test equipment shall be the responsibility of each worker. The ICN shall not be responsible for the security of any property left on ICN's property or on property controlled by the ICN or the State of Iowa.**
7. **Contractor shall be responsible for instructing its employees in safety measures considered appropriate for the job. In addition, the Contractor shall not permit placing or use of tools or materials in traffic lanes or other locations. The tools or materials shall not be placed in such a manner so as to create safety hazards to State employees, contracting agency employees, the public or themselves.**
8. Excavations and Trenches: The ICN requires all open excavations or trenches to be monitored and attended to during construction per. The ICN requires all open excavations and trenches backfilled the same day. If the contractor is required to leave an excavation or trench open, then the contractor shall properly fence and/or cover the excavation for safety. Contractor shall follow all OSHA requirements for excavation and trench safety.
9. **Contractor and its employees shall comply with all OSHA regulations. The contractor shall comply with all applicable State and Federal Laws.**
10. **Contractor shall comply with all Iowa One Call requirements as provided by Iowa Code, Chapter 480.**
11. Provide all labor and supervision for the project.
12. Provide and install materials needed to result in a fully functional system meeting ICN standards, whether or not the materials or methods are specifically mentioned in this document. See the list of ICN-furnished materials.
13. Install cable route markers furnished by ICN. Where possible, install markers adjacent to poles, buildings or in other protected areas.
14. A copy of this Scope of Work and the Engineering Plan for this project shall be on site and available any time work is being performed. Failure to have the required documents on site may result in ICN requiring the contractor to stop working until the required documents are on-site.
15. **Subcontractors shall meet the same qualifications stated for Contractors. Contractor shall obtain approval of the contracting agency's project manager prior to using a subcontractor on any project. Once a subcontractor has been approved, it may be used on other projects.**
16. Restore all damage to private property, Right-of-Way, ICN property, and any other property damaged in the course of the work.
 - 16.1. **Any disruption of grass in an individual's yard or in a private maintained area of the public right of way (the area between the sidewalk and the street curb) must be restored through re-sodding. Any disruption of the grass in the median way or an unimproved shoulder must be restored either through re-sodding or re-seeding as required by the ROW owner.**
 - 16.2. Areas shall be restored to original or better condition.
 - 16.3. Dirt shall be mechanically compacted around handholes and pits.
 - 16.4. Lawns shall be sodded with like grass.
 - 16.5. Contractor is responsible for watering the sod until it has knitted to the ground beneath.
 - 16.6. All debris shall be removed from the construction areas including but not limited to: construction materials, trash, large objects or stones within backfilled areas, etc.

Duct Installation Requirements

1. HDPE duct shall be no less than 48 inches deep.
2. Duct shall be installed in the public Right-of-Way.
3. When crossing Iowa Highway in DOT Right-of-Way, duct shall be no less than 48 inches below grade under the roadway and shoulders. HDPE may be used under the roadway and shoulders if installed at a minimum depth of 48”.
4. Should it be necessary to cross private property, the Contractor may apply to the ICN for an exception, and request permission to secure an easement. The easement is required to be in the name of ICN and the contractor shall have the easement prepared by a Land Surveyor licensed in the state of Iowa. Contractor shall be responsible for all fees unless previously authorized by the ICN.
5. At the conclusion of the project, provide and leave a pull rope in all ducts, conduits and pathways, including indoor, outdoor, new and existing.
6. Dirt shall be mechanically compacted at all duct splices, bore pits and around handholes.
7. Ground shall be restored to the condition found prior to construction and debris removed prior to sodding or seeding.
8. All conduits shall be plugged via duct seal or other method upon completion of cable installation.
9. If Schedule 40 PVC conduit is utilized, all angles (45, 90 degree or other) require fittings to long sweep to accommodate minimum cable bend radiuses.
10. The ICN requires pictures by the contractor and/or on-site inspection by ICN staff prior to completion of the project where pipe and fittings are not exposed; i.e. underground, behind a wall, etc.

Handhole Requirements

1. Install handholes so that the lid is level and flush with the surrounding natural grade. The lid SHALL NOT extend above the surrounding natural grade.
2. Provide ¼” opening hardware cloth type screen wire below the handhole.
3. Provide 12 inches of “pea gravel” or rock no larger than ¾” below the handhole. Rock shall be compacted. Gravel shall extend a minimum of 6 inches beyond the outside walls of the handhole.
4. Do not place gravel inside handhole above the hardware cloth.
5. Conduit shall extend a minimum of 6” above the hardware cloth/gravel.
6. Failure of the contractor to install handholes as specified will cause the contractor to return and re-install the handhole according to this specification before payment for the project is made.
7. Handhole installations shall follow ICN standard practice engineering plan.

Fiber Installation Requirements

1. Install fiber according to industry “Best Practices”.
2. The contractor shall not violate the manufacturer’s minimum installation bend radius when the cable is under tension, or the minimum installed bend radius.
3. To prevent exceeding the manufacturer’s maximum pulling tension during installation of the fiber optic cable, the contractor shall use a “Break-away” pulling swivel when installing cable.
4. The “Break-Away” function shall activate at or below the maximum pulling tension specified by the cable manufacturer.
5. The contractor shall test all strands of the fiber, on the reel, prior to beginning fiber installation. Confirm that all strands meet manufacturer’s loss specifications.
6. The contractor shall field verify all lengths and existing conditions prior to starting construction.
7. Slack loops in handholes shall be coiled, installed, and secured to avoid damage to the coil and not interfere with lids.
8. Slack loops at splices shall be coiled to match the existing fiber cable tails and allowance for splice preparation.
9. ICN Fiber in all handholes shall be labeled with ICN wrap around cable tags or other labeled cable tags.

Building Entry Requirements

1. Weather-seal all penetrations.
2. Use mortar or similar cement to seal penetration of brick or cement block.
3. Firestop penetrations of any fire-rated floor, wall or ceiling.
4. Replace the Firestop material in any existing Firestopped penetration used by the contractor.
5. All outdoor conduits, of any length, shall be Galvanized Iron Pipe (GIP). EMT, PVC and plastic are prohibited.
6. Immediately upon installation, seal the ends of all ducts with duct seal or expansion foam to prevent siltation or filling with moisture. This applies to both new and existing ducts.
7. Exterior exposed conduit shall be Galvanized Iron Pipe. EMT and plastic prohibited.
8. At the conclusion of the project, ensure that a pull rope is left in ALL pathways, both inside and outside, new and existing.

Locate Facility Requirements

1. Tracer wire shall be continuous.
2. Splices in the tracer wire are not allowed. If tracer wire is accidentally severed, request permission from ICN to splice.
3. Wire splices only in handholes.

4. Use either an epoxy splice kit, Scotch 3M 3832 or a Molex PermaSeal Butt Splice. 10-12 Ga. Splice materials SHALL be designed for underground applications.
5. Leave the wire splice visible in the handhole.
6. Route a ground wire from the ground inside the building, through the entry to the TII 136 terminal.
7. Secure all riser conduits with 3 each two-hole conduit straps.
8. Wire the pedestal/terminal so that locates may be performed in any direction and from the far end.
9. Do not leave any exposed tracer wire or ground wire.
10. Permanently ground the tracer wire at the handhole on the furnished ground rod.
11. At the conclusion of the project leave the tracer wire shield shorted to ground in the locate terminal.
12. Use tracer wire that is rated for direct burial where required. THHN insulation is acceptable for placement within duct, handholes, or enclosures, or any location not in direct continuous contact with soil or water.
13. Label all wires in the locate terminal/pedestal/TriView. (I.e. "Ground", "Facing DMACC", "Facing North" etc.)
14. Failure to label the locate wires will cause the contractor to return and properly label the wires before payment for the project is made.
15. Bond tracer wire(s) **within** splice enclosures utilizing a 3M 4460-D\FO Shield Bonding Kit.
16. Route tracer wire(s) out of splice enclosure through a single port utilizing a FOSC closure sealing kit.
17. At splice locations with no locate pedestal, tracer wires shall be bonded together, within the splice enclosure.
18. At each end of any tracer wire, use appropriate-sized ring terminal (crimp) connectors.

DELIVERABLES/ACCEPTANCE:

1. Contractor shall provide construction redline as-builts with:
 - 1.1. Offsets to fixed objects to the cable/conduit running line, handholes and new facilities.
 - 1.2. Meter marks of cable installations at handhole entry/exit, splice locations, building entries, etc.
 - 1.3. One original set of as-built drawings must be provided within two (2) weeks after completion of construction for the ICN management records. Redline as-built drawings must be complete.
2. Contractor shall provide splicing redline of all splicing completed and validation that the splice plan was followed.
3. Contractor is responsible to locate fiber until acceptance by the ICN. Acceptance includes:
 - 3.1. Submission of construction and splicing red line drawings by contractor.
 - 3.2. Assignment of link number by the ICN (if applicable).
 - 3.3. Submission of final as built drawing by the ICN to the ICN Network Maintenance Provider.
 - 3.4. Submission to Iowa One Call and the ICN Network Maintenance Provider's contract locator.
 - 3.5. The measurements in the Statement of Work are estimates and need to be verified by the contractor.
4. **Only written modifications to this Scope of Work are binding** - Verbal changes to this scope of work by any person or persons are not binding, unless confirmed in writing.
5. Final payment will not be processed until all deliverables are received and accepted.